



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

PRELIMINARY ISSUE

D130-1048-042
Job Sheet 182415

Accounting Job RD17-1048-01



Part No: D130-1048-042

Job Qty: 1 ea

Part Name: EC130 Skidtube Assembly, RH



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 8/23/18

Job Tracking No:

Created By: Marie Lajeunesse

Due Date: 9/7/18

Description:

Type: R+D

Note: D130-1048-042 REV. PRELIM-A8 18.08.15 new issue DP Verify DD

Ship Via:

POSITIVE RECALL

EFFECTIVE 18-09-24 AUTH: MLC

RELEASED DATE

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	9/7/18	9/7/18	0.00	0.00	Start Up Skid tubes-3		MML
100	Skid tubes	1 pcs	9/7/18	9/7/18	0.00	0.25	Skid tubes-2		MML
110	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC5		MML
120	Outsource	1 pcs	9/7/18	9/7/18	0.00	0.00	Outsource2		CT 18-9-25
130	Packaging	1 pcs	9/7/18	9/7/18	0.00	0.00	Packaging2		SEP 27 2018
140	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC5		18-09-28
150	Skid tubes	1 pcs	9/7/18	9/7/18	0.00	1.00	Skid tubes-2		18-10-03
160	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC5		OCT 04 2018
162	Outsource	1 pcs	9/7/18	9/7/18	0.00	0.00	Outsource2		N/A
164	Packaging	1 pcs	9/7/18	9/7/18	0.00	0.00	Packaging2		N/A
166	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC6		N/A
170	HandFinish	1 pcs	9/7/18	9/7/18	0.00	0.00	HandFinish1		N/A
180	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC7-5		N/A
182	SprayPaint	1 pcs	9/7/18	9/7/18	0.00	0.00	Spray Paint		N/A
184	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC14		N/A
190	Skid tubes	1 pcs	9/7/18	9/7/18	0.00	1.00	Skid tubes-2		18-10-03
200	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC5		OCT 04 2018
210	HandFinish	1 pcs	9/7/18	9/7/18	0.00	0.10	HandFinish6		N/A
220	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC7-5		N/A
230	SprayPaint	1 pcs	9/7/18	9/7/18	0.00	0.50	Spray Paint		N/A
240	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC14		N/A
250	HandFinish	1 pcs	9/7/18	9/7/18	0.00	0.17	HandFinish4		N/A
260	QC	1 pcs	9/7/18	9/7/18	0.00	0.00	QC5		N/A
270	Packaging	1 pcs	9/7/18	9/7/18	0.00	0.00	Packaging3		N/A
280	DC	1 pcs	9/7/18	9/7/18	0.00	0.00	DC		21
290	QC21-FG	1 Ea	9/7/18	9/7/18	0.00	0.00	QC21		OCT 04 2018

Part Op 100 - 1-Remove bending marks

Descriptions: 120 - Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order

130 - Ensure copy of NDT results attached to work order.

150 - 1-Chamfer AFT end of tube as per DWG sheet 2 note 8. 2-Chamfer FWD end of tube as per DWG sheet 2 note 9.

3-Identify as per note 6. 4-Transfer drill D5571-1 saddle into D5611-1 skid tube. Ensure tube and saddle are within 1 degree of tube C/L. ***Tube and saddle must be at 90 degrees for transfer drilling. 5-Locating from previously transfer drilled holes cleco DT10416-B. Pilot drill cross bolt spacer holes, 2 AFT wear plate holes and 2 FWD wear plate holes.

6-Cleco DT10432 on two previously drilled FWD wear plate holes and drill remaining four FWD wear plate holes. Cleco

DQA:

Date:



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Container No: S113885



Part: D130-1048-042

Job No: 182415

Serial No/Batch: S113885

Revision: A8

Inspector:

Exp Date:

Instructions:

Date: 09/27/18

NON-CONFORMANCE / UPDATE

Work Order update only ☐

N		AGAINST DEPARTMENT/PROCESS							
work	☐	Skid-tube	☐	Cross tube	☐	Water Jet	☐	Engineering	☐
scrap	☐	Machining	☐	Small Fab	☐	Prod. Eng. Coord.	☐	Quality	☐
as-is	☐	Thermoforming	☐	Finishing	☐	Rec/Store/Packaging	☐	Other	☐
oved	☐	Large Fab	☐	Composite	☐	Supplier	☐		
		QTY Effective :					MRB (QS1042) Approval		

Description Work Order Deviation

Disposition

Completed By

Lead hand / Supervisor
Approval VerificationQC / QA Coordinator
Approval

Root Cause

Environment	☐	No Re-verification	☐
Design	☐	Operator	☐
Doc/Data	☐	Offset/Setup	☐
Equip/Tooling	☐	Supplier	☐
Handling/Pre	☐	Training	☐
Material	☐	Use for Testing	☐
Internal Transport	☐	Poor Information	☐
Tribal Knowledge	☐	Rushing	☐
LOA	☐	Product Improvement	☐
Substation	☐	Process Improvement	☐
Past Expiry Date	☐	Manufacturing Process	☐
Misidentified	☐	Past Due	☐

Pressure/Forced
Bending
Centre Not Concentric
Cracks
Crimp/Kink/Ripple/Wave
Cuffs
Crushing
Heat Treat
Wave/Twist in Tube
Marks/Chatter

FAULT CATEGORY

Temperature/Cure
Set-up
BOM/Route
Broken/Damage/Defect
Inspection Incomplete/Unqualified
Contamination
Countersink
Cut Too Short
Instructions Incomplete/Unclear
Drill Holes

Power Loss/Surge
Folio/Program
Grain
Weld
Wrong Stock Pulled
Out of Sequence
Off-set
Mislabelled
Fit/Function
Misaligned/off center

Positioned Wrong
Outside Dimensions
Over/Under tolerance
Part Incorrect
Part Lost/Missing
Part Moved
Drawing
Finish
Misread
Turning Sequence

OTHER :

DT10439 on two previously drilled AFT wear plate holes and drill remaining four AFT wear plate holes. 7-Open blade fitting holes and deburr as per note 5. Test fit blade fitting. 8-Open holes section C-C, D-D and E-E to finished size.

162 - Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order.

164 - Ensure copy of NDT results attached to work order.

182 - 1-Prime inside & outside cross tube as per DWG sheet2 note 2 and QSI 005 4.2.1.3.3 BATCH:_____

190 - 1-Wet install saddle as per DWG sheet 1note 8 and 9. Pro Seal PR-1764 B_____EXP_____***12hr cure time*** 2-Shave rivets as required. 3-Remove chips from inside of tube and clean tube. Prepare for final inspection.

210 - Touch up ALODINE. Do not submerge tube in deoxidizer.

230 - 1-Prime inside & outside cross tube as per DWG sheet1 note 2 and QSI 005 4.2.1.3.3 BATCH:_____

NOTEdo not paint inside saddle bore. Primer only. 2-Paint Outside of Tube as per DWG sheet 1 note 2 and Dart QSI 005 4.2.2.4 BATCH:_____

250 - Install inserts as per DWG sheet 1 note 10.

270 - Location:_____

280 - Photocopy blue file & type labels per PPP D130-1048-041 CHG_____

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D5611-1	EC130 Skidtube	1 Ea (1 ea)	90-Start up Operation	S111357
D5571-1	Saddle	1 Ea (1 ea)	150-Skidtubes	5092439
CR7621S-06-05	Rivet	22 Ea (22 ea)	190-Skidtubes	5102967
ALS4-1032-225	Rivnut	8 Ea (8 ea)	250-HandFinish	5058138

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D5611-1	1	8	0
150-Skidtubes	D5571-1	1	4	0
190-Skidtubes	CR7621S-06-05	22	509	0
250-HandFinish	ALS4-1032-225	8	1,917	0

Part Specifications

Specifications could not be found.

Plex 9/24/18 2:34 PM Dart.lajeunesse.marie

14-15 PUGHEN, JONES
Newbury, ON K4A 1K7
CANADA
TEL: 1 813 832-5200
Email: sales@dartero.com
www.dartero.com

DART
AERO SPACE

Container No: S113885

Part: D130-1043-042

Job No. 182415

Serial No/Batch: S113885

Revision: A8

Inspector:

Exp Date:

Instructions

Date: 09/26/18

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

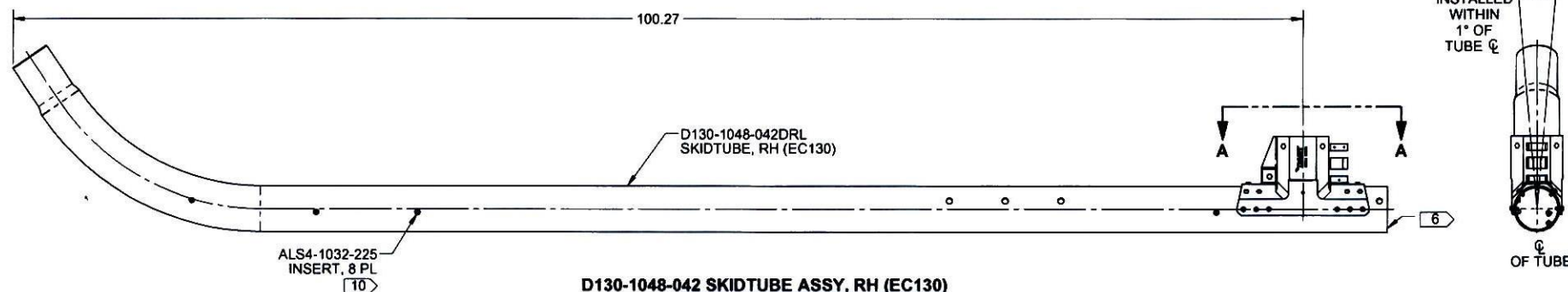
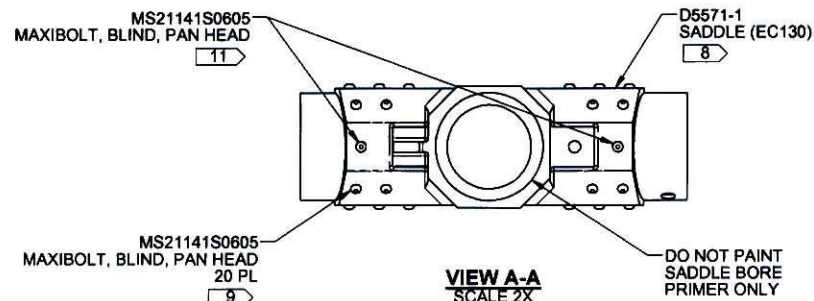
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

QTY -042	P/N	DESCRIPTION
X	D130-1048-042	SKIDTUBE ASSY, RH (EC130)
1	D130-1048-042DRL	SKIDTUBE, RH (EC130)
1	D5571-1	SADDLE (EC130)
22	MS21141S0605 OR CR7621S06-05	MAXIBOLT, BLIND, PAN HEAD
8	ALS4-1032-225	INSERT

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 182415 MWS
11-09-24



NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: PAINT OUTSIDE PER DART QSI 005 4.2.2.4 (FLOAT SKIDTUBE PAINT) AFTER ASSEMBLY
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D130-1048-042" AND S/N PER DART QSI 044 6.4 ON INSIDE OF TUBE, MAX 0.5" FROM AFT END OF TUBE
- 7) WEIGHT: 20.33 lbs
- 8) SEAL FAYING SURFACE WITH SIKAFLEX-241/-291 OR PROSEAL 890 OR EQUIVALENT MIL-S-8802 SEALANT
- 9) POSITION SADDLE AND TRANSFER DRILL $\phi 0.193$ HOLE PATTERN FROM SADDLE ONTO SKIDTUBE. OPEN HOLES THRU SADDLE AND SKIDTUBE TO $\phi 0.199$ - $\phi 0.202$. TOUCH-UP HOLES WITH CHEMICAL FILM (ALODINE 1200) PER MIL-DTL-5541. WET INSTALL MAXIBOLTS WITH SIKAFLEX-241/-291 OR PROSEAL 890 OR EQUIVALENT MIL-S-8802 SEALANT
- 10) INSTALL ALS4 INSERTS IN EXISTING $\phi 0.297$ HOLES
- 11) TRANSFER DRILL $\phi 0.193$ HOLES FROM SADDLE TO SKIDTUBE. OPEN HOLES THRU SADDLE AND SKIDTUBE TO $\phi 0.199$ - $\phi 0.202$. ENSURE CLEAN HOLES FOR GOOD ELECTRICAL BONDING. TOUCH-UP HOLES WITH ELECTRICALLY CONDUCTIVE CHEMICAL FILM (ALODINE 600) PER MIL-DTL-5541. INSTALL MAXIBOLTS DRY (NO SEALANT).

WORK IN PROGRESS

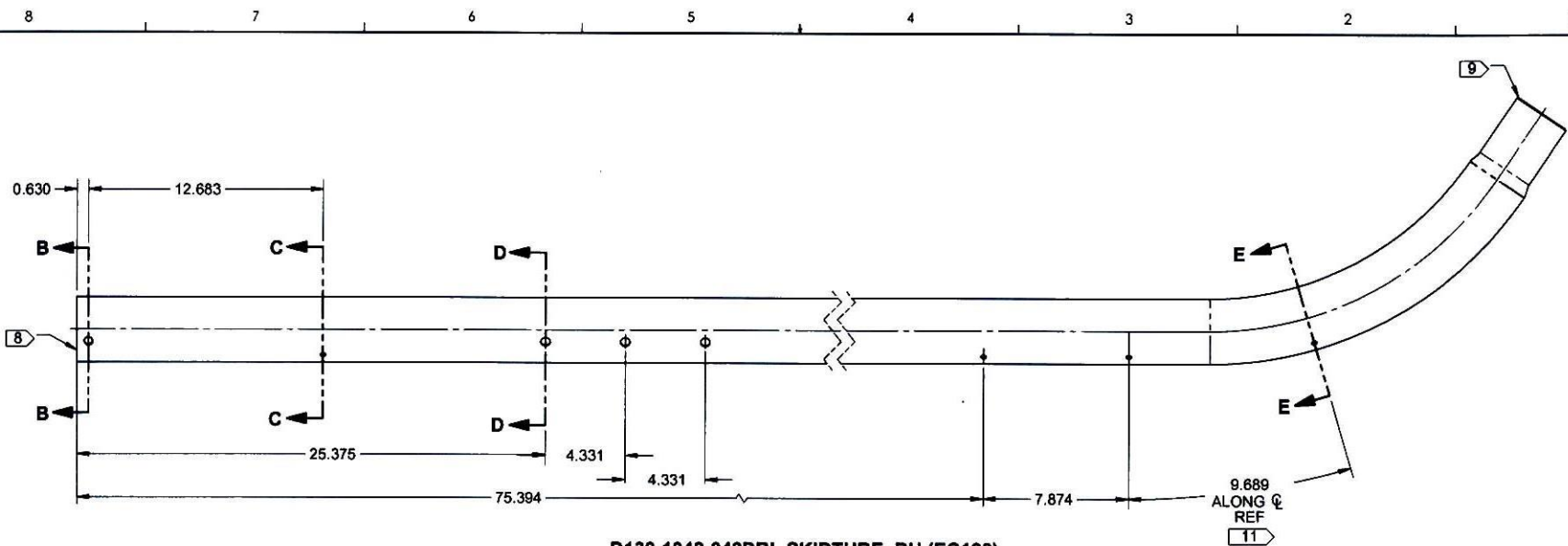
PRELIMINARY ISSUE

REV	DESCRIPTION	BY	DATE
A	NEW ISSUE	ZF	18.05.07
DESIGN	NO		
DRAWN	ZF		
CHECKED	MW		
MFG. APPR.	JFS		
APPROVED			
DE APPR.			
DATE	18.05.07		

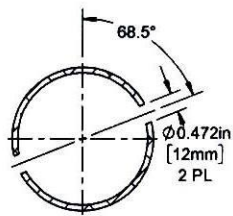
DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. **D130-1048-042** REV. A8
SHEET 1 OF 2
TITLE **SKIDTUBE, RH (EC130)** SCALE NTS

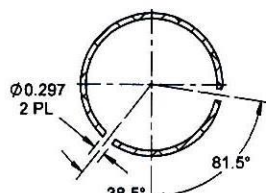
COPYRIGHT © 2018 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.



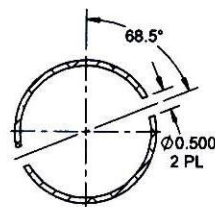
D130-1048-042DRL SKIDTUBE, RH (EC130)
(DRILLING DETAIL)



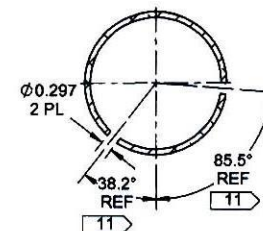
SECTION B-B
SCALE 2X



SECTION C-C
SCALE 2X, 3 PL



SECTION D-D
SCALE 2X, 3 PL



SECTION E-E
SCALE 2X

NOTES:

- 1) MATERIAL: MAKE FROM D5611-1
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2.1.3.3 (FLOAT SKIDTUBE PRIMER)
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.37 lbs
- 8) CHAMFER ID 0.06X0.06 WHERE INDICATED
- 9) CHAMFER OD 0.06X0.06 WHERE INDICATED
- 10) LIQUID PENETRANT INSPECT OUTSIDE SURFACE PER QSI 038 PRIOR TO DRILLING.
- 11) LOCATE HOLES USING DRILLING JIG DT10432.

WORK IN PROGRESS

PRELIMINARY ISSUE

DESIGN	NO	DART AEROSPACE LTD	
DRAWN	ZF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	MW	DRAWING NO.	REV. A8
MFG. APPR.	JFS	D130-1048-042	SHEET 2 OF 2
APPROVED		TITLE	SCALE
DE APPR.		SKIDTUBE, RH (EC130)	NTS
DATE	18.05.07	COPYRIGHT © 2018 BY DART AEROSPACE LTD	
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS FURNISHED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

D130-1048-042
Job Sheet 182419

Accounting Job RD17-1048-01



Part No: D130-1048-042

Job Qty: 1 ea

Part Name: EC130 Skidtube Assembly, RH



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 8/23/18

Job Tracking No:

Due Date: 9/7/18

Created By: Marie Lajeunesse

Type: R+D

Description:

Note: PRELIM. IPP Rev. A 18.08.15 new issue DP Verify DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier			Sign-off
					Setup hrs	Run Hrs	Workcenter	Supplier	Lead Time	
90	Start up Operation	1 Ea		9/7/18	0.00	0.00	Start Up	Skid tubes-3		
100	Skid tubes	1 pcs		9/7/18	0.00	0.25		Skid tubes-2		
110	QC	1 pcs		9/7/18	0.00	0.00		QC5		
120	Outsource	1 pcs		9/7/18	0.00	0.00		Outsource2		
130	Packaging	1 pcs		9/7/18	0.00	0.00		Packaging2		
140	QC	1 pcs		9/7/18	0.00	0.00		QC5		
150	Skid tubes	1 pcs		9/7/18	0.00	1.00		Skid tubes-2		
160	QC	1 pcs		9/7/18	0.00	0.00		QC5		
170	HandFinish	1 pcs		9/7/18	0.00	0.00		HandFinish1		
180	QC	1 pcs		9/7/18	0.00	0.00		QC7-5		
190	Skid tubes	1 pcs		9/7/18	0.00	1.00		Skid tubes-2		
200	QC	1 pcs		9/7/18	0.00	0.00		QC5		
210	HandFinish	1 pcs		9/7/18	0.00	0.10		HandFinish6		
220	QC	1 pcs		9/7/18	0.00	0.00		QC7-5		
230	SprayPaint	1 pcs		9/7/18	0.00	0.50		Spray Paint		
240	QC	1 pcs		9/7/18	0.00	0.00		QC14		
250	HandFinish	1 pcs		9/7/18	0.00	0.17		HandFinish4		
260	QC	1 pcs		9/7/18	0.00	0.00		QC5		
270	Packaging	1 pcs		9/7/18	0.00	0.00		Packaging3		
280	DC	1 pcs		9/7/18	0.00	0.00		DC		
290	QC21-FG	1 Ea		9/7/18	0.00	0.00		QC21		

Part Op 100 - 1-Remove bending marks

Descriptions: 120 - Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order

130 - Ensure copy of NDT results attached to work order.

150 - 1-Chamfer AFT end of tube as per DWG sheet 2 note 8. 2-Chamfer FWD end of tube as per DWG sheet 2 note 9.

3-Identify as per note 6. 4-Transfer drill D5571-1 saddle into D5611-1 skid tube. Ensure tube and saddle are within 1 degree of tube C/L. ***Tube and saddle must be at 90 degrees for transfer drilling. 5-Locating from previously transfer drilled holes cleco DT _____. Pilot drill cross bolt spacer holes, 2 AFT wear plate holes and 2 FWD wear plate holes.

6-Cleco DT _____ on two previously drilled FWD wear plate holes and drill remaining four FWD wear plate holes. 7-Open blade fitting holes and deburr as per note 5. Test fit blade fitting. 8-Open holes section C-C, D-D and E-E to finished size.

190 - 1-Wet install saddle as per DWG sheet 1 note 8 and 9. Pro Seal PR-1764 B _____ EXP _____ ***12hr cure time*** 2-Shave rivets as required. 3-Remove chips from inside of tube and clean tube. Prepare for final inspection.

210 - Touch up ALODINE. Do not submerge tube in deoxidizer.

230 - 1-Prime inside & outside cross tube as per DWG sheet 1 note 2 and QSI 005 4.2.1.3.3 BATCH: _____

P0041100

Plex 8/23/18 2:45 PM Dart.lajeunesse.marie

DAS
13
9-89

NOTEdo not paint inside saddle bore. Primer only. 2-Paint Outside of Tube as per DWG sheet 1 note 2 and Dart QSI
005 4.2.2.4 BATCH: _____

250 - Install inserts as per DWG sheet 1 note 10.

270 - Location: _____

280 - Photocopy blue file & type labels per PPP D130-1048-041 CHG _____

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D5611-1	EC130 Skidtube	1 Ea (1 ea)	90-Start up Operation	183489 / 5111357
D5571-1	Saddle	1 Ea (1 ea)	150-Skidtubes	
CR3523-6-06	Cherry Max Blind Rivet	22 Ea (22 ea)	190-Skidtubes	
ALS4-1032-225	Rivnut	8 Ea (8 ea)	250-HandFinish	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D5611-1	1	0	0
150-Skidtubes	D5571-1	1	4	0
190-Skidtubes	CR3523-6-06	22	0	0
250-HandFinish	ALS4-1032-225	8	2,804	0

Part Specifications

Specifications could not be found.

Plex 8/23/18 2:45 PM Dart.lajeunesse.marie



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041100**

Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO041100
PO Date: 9/21/18
Due Date: 9/25/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Phone:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	182067	D130-1048-141	EC130 Fwd Crosstube ISSUE P/O: _____ NDT C OF C IS REQUIRED	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
			1 X SEP 27 2018								
	182064		1 X SEP 27 2018	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
	182059		1 X SEP 27 2018	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
	182065		1 X SEP 27 2018	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
Sub Total:							4	0	4		\$535.00

2	182415	D130-1048-042	EC130 Skidtube Assembly, RH Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
			DAS 9 9-89								
			1 X SEP 27 2018								
	182418		1 X SEP 27 2018	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
Sub Total:							2	0	2		\$267.50

3	182412	D130-1048-041	EC130 Skidtube Assembly, LH Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
			1 X SEP 27 2018								
	182413		1 X SEP 27 2018	Firmed	-	9/27/18	1 pcs	0 pcs	1 pcs	\$133.75/pcs	\$133.75
Sub Total:							2	0	2		\$267.50

Grand Total: \$1,070.00

Order Notes

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

**skyservice****Work Order Traveler**
Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO37535	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO041100
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

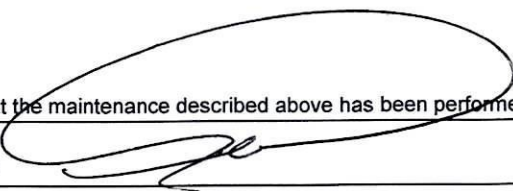
Work Required:

CARRY OUT NDT ON:

4 EC 130 FWD CROSSTUBES , P/N# D130-1048-141 , J/S# 182059 , 182064 , 182065 , 182067
2 EC 130 SKIDTUBE ASSY RH , P/N# D130-1048-042 , J/S# 182418 , 182419
2 EC 130 SKIDTUBE ASSY LH , P/N# D130-1048-041 , J/S# 182412 , 182413

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417 REV. 16						SEP 21 2018	 
NO CRACK FOUND							
PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142							
<i>Description</i>	<i>Location</i>	<i>P/N</i>	<i>Qty</i>	<i>Batch</i>	<i>S/N Off</i>	<i>S/N On</i>	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: SEP 21 2018
Name: RAFIK MELIKIAN		



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041261**

Supplier: ATE003-VC
Atelier Debosselage
358 Principale
Calumet
QC
J0V 1B0 Canada
Phone: 819 242 5633

PO No: PO041261
PO Date: 10/4/18
Due Date: 10/5/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Lavoie, Chantal
Phone: clavoie@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Supplier Part No	Item No	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1			Paint d130-1048 crosstube	OUTSIDE SERVICES		Firmed	71900-200-0000	10/5/18	4 Ea	0 Ea	4 Ea	\$250.00/Ea	\$1,000.00
2			Paint d130-1048 skidtube	OUTSIDE SERVICES		Firmed	71900-200-0000	10/5/18	2 Ea	0 Ea	2 Ea	\$250.00/Ea	\$500.00
3			Paint saddle	OUTSIDE SERVICES		Firmed	71900-200-0000	10/5/18	4 Ea	0 Ea	4 Ea	\$40.00/Ea	\$160.00

Grand Total: \$1,660.00

Order Notes

Plex 10/4/18 3:24 PM dart.lavoie.chantal

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: <u>182415</u>	DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS			
Part No. <u>P130-1048042</u>		Skid-tube ☐	Cross tube ☐	Eng. (Non-AW) ☐	Engineering ☒
		Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Water Jet ☐
		Large Fab ☐	Finishing ☐	Rec/Store/Packaging ☐	Supplier ☐
					Quality ☐

Date: 18/10/1 Sequence #: _____ QTY Affected : _____

MRB (QSI042)

DAS
12
9-89

18/10/1

Description Work Order Deviation	Disposition	Completed By
DS611-1 Skid tubes were supplied uncut, ie. total length is over tolerance.	Cut tubes to length per Dwg DS611 Rev.A. Total tube length should be 106.83. Actual length: <u>106.83</u>	<u>18-10-01</u>
	DAS 68 9-89	Lead hand / Supervisor DAS 9 9-89 18-10-04
		QC / QA Coordinator DAS 9 9-89 18-10-04

Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Presservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐	FAULT CATEGORY <table border="0"> <tr> <td>☐ Pressure/Forced</td> <td>☐ Contamination</td> <td>☐ Power Loss/Surge</td> <td>☐ Positioned Wrong</td> </tr> <tr> <td>☐ Bending</td> <td>☐ Misaligned/off center</td> <td>☐ Folio/Program</td> <td>☐ Outside Tolerance</td> </tr> <tr> <td>☐ Crushing</td> <td>☐ BOM/Route</td> <td>☐ Grain Direction</td> <td>☐ Drawing</td> </tr> <tr> <td>☐ Cracks</td> <td>☐ Broken/Damage/Defect</td> <td>☐ Weld</td> <td>☐ Finish</td> </tr> <tr> <td>☐ Crimp/Kink/Ripple/Wave/Twist</td> <td>☐ Incomplete/Unclear Instructions</td> <td>☐ Wrong Stock Pulled</td> <td>☐ Part Lost/Missing</td> </tr> <tr> <td>☐ Marks/Chatter</td> <td>☐ Drill Holes</td> <td>☐ Out of Sequence</td> <td>☐ Misread</td> </tr> <tr> <td>☐ Mislabeled</td> <td>☐ Fit/Function</td> <td>☐ Off-set/Set-up</td> <td></td> </tr> </table>	☐ Pressure/Forced	☐ Contamination	☐ Power Loss/Surge	☐ Positioned Wrong	☐ Bending	☐ Misaligned/off center	☐ Folio/Program	☐ Outside Tolerance	☐ Crushing	☐ BOM/Route	☐ Grain Direction	☐ Drawing	☐ Cracks	☐ Broken/Damage/Defect	☐ Weld	☐ Finish	☐ Crimp/Kink/Ripple/Wave/Twist	☐ Incomplete/Unclear Instructions	☐ Wrong Stock Pulled	☐ Part Lost/Missing	☐ Marks/Chatter	☐ Drill Holes	☐ Out of Sequence	☐ Misread	☐ Mislabeled	☐ Fit/Function	☐ Off-set/Set-up	
☐ Pressure/Forced	☐ Contamination	☐ Power Loss/Surge	☐ Positioned Wrong																										
☐ Bending	☐ Misaligned/off center	☐ Folio/Program	☐ Outside Tolerance																										
☐ Crushing	☐ BOM/Route	☐ Grain Direction	☐ Drawing																										
☐ Cracks	☐ Broken/Damage/Defect	☐ Weld	☐ Finish																										
☐ Crimp/Kink/Ripple/Wave/Twist	☐ Incomplete/Unclear Instructions	☐ Wrong Stock Pulled	☐ Part Lost/Missing																										
☐ Marks/Chatter	☐ Drill Holes	☐ Out of Sequence	☐ Misread																										
☐ Mislabeled	☐ Fit/Function	☐ Off-set/Set-up																											
Other/Details: _____																													

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: <u>182415</u> Part No. <u>D130-1048-042</u> NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☐</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																															
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																																																																				
Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐																																																																				
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																																																																				
Large Fab ☐	Composite ☐	Supplier ☐																																																																					
Date: <u>14/10/2</u>		Step #: _____		QTY Effective: <u>①</u>		MRB (QSI042) Approval <u>9/</u> DAS 12 9-89 <u>14/10/2</u>																																																																	
Description Work Order Deviation - Prime/print not per dwg or QSI005. - Second LPI not done - step 16Z - Electrically conductive chemical film (Clodine 600) not used.				Disposition - Paint is representative and acceptable for testing. Painting P/O: _____ - Second LPI not req'd for testing - Electrically conductive chemical film not required for testing.				Completed By DAS 12 9-89 <u>14/10/2</u> Lead hand / Supervisor Approval Verification <u>PD 18-10-02</u> QC / QA Coordinator Approval <u>PD 18-10-02</u>																																																															
Root Cause <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Environment ☐</td> <td style="width:15%;">No Re-verification ☐</td> </tr> <tr> <td>Design ☐</td> <td>Operator ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☐</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> </tr> </table>				Environment ☐	No Re-verification ☐	Design ☐	Operator ☐	Doc/Data ☐	Offset/Setup ☐	Equip/Tooling ☐	Supplier ☐	Handling/Pre ☐	Training ☐	Material ☐	Use for Testing ☐	Internal Transport ☐	Poor Information ☐	Tribal Knowledge ☐	Rushing ☐	LOA ☐	Product Improvement ☐	Substation ☐	Process Improvement ☐	Past Expiry Date ☐	Manufacturing Process ☐	Misidentified ☐	Past Due ☐	FAULT CATEGORY <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Pressure/Forced ☐</td> <td style="width:15%;">Temperature/Cure ☐</td> <td style="width:15%;">Power Loss/Surge ☐</td> <td style="width:15%;">Positioned Wrong ☐</td> </tr> <tr> <td>Bending ☐</td> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>Centre Not Concentric ☐</td> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Cracks ☐</td> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Crimp/Kink/Ripple/Wave ☐</td> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Cuffs ☐</td> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Crushing ☐</td> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Heat Treat ☐</td> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>Finish ☐</td> </tr> <tr> <td>Wave/Twist in Tube ☐</td> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Marks/Chatter ☐</td> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> </table>				Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Environment ☐	No Re-verification ☐																																																																						
Design ☐	Operator ☐																																																																						
Doc/Data ☐	Offset/Setup ☐																																																																						
Equip/Tooling ☐	Supplier ☐																																																																						
Handling/Pre ☐	Training ☐																																																																						
Material ☐	Use for Testing ☐																																																																						
Internal Transport ☐	Poor Information ☐																																																																						
Tribal Knowledge ☐	Rushing ☐																																																																						
LOA ☐	Product Improvement ☐																																																																						
Substation ☐	Process Improvement ☐																																																																						
Past Expiry Date ☐	Manufacturing Process ☐																																																																						
Misidentified ☐	Past Due ☐																																																																						
Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐																																																																				
Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐																																																																				
Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐																																																																				
Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐																																																																				
Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐																																																																				
Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐																																																																				
Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐																																																																				
Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐																																																																				
Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐																																																																				
Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐																																																																				
OTHER: _____																																																																							

Entered: _____ Date: _____

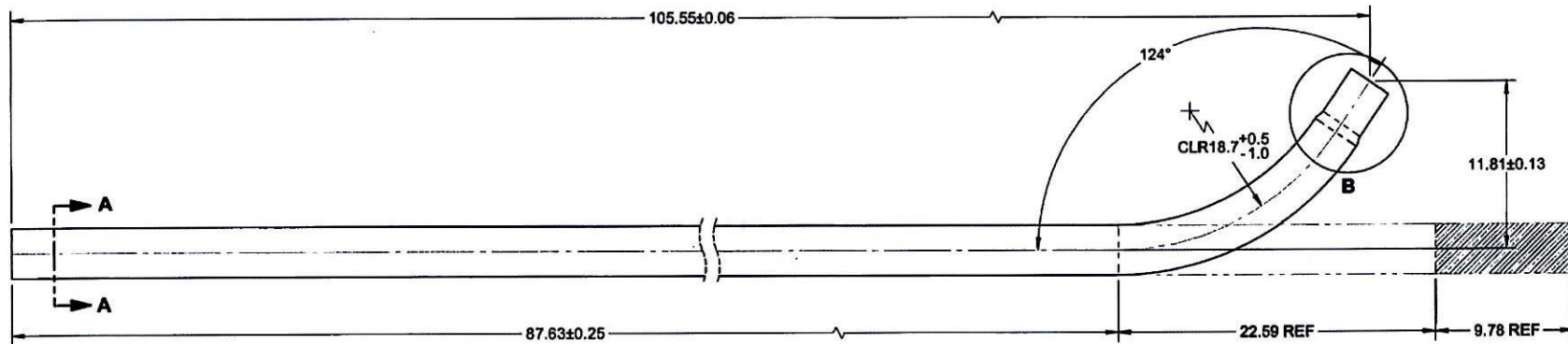


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

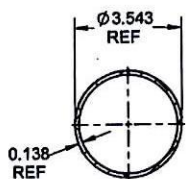
NCR No.

Route update only

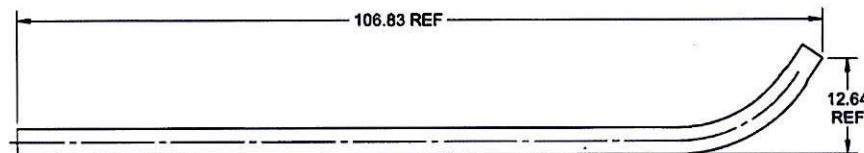
Job: <u>182415</u>		DISPOSITION		DEPARTMENT/PROCESS			
Part No. <u>D130-1048-042</u>		Rework ☒ Scrap ☐ Use-as-is ☐		Skid-tube ☐ Machining ☐ Large Fab ☐	Cross tube ☐ Small Fab ☐ Finishing ☐	Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐	Engineering ☒ Water Jet ☐ Supplier ☐ Quality ☐
Date: <u>18/10/3</u>		Sequence #:		QTY Affected:			MRB (QSI042) <u>DAS</u> <u>12</u> <u>9-89</u> <u>14-10-03</u>
Description Work Order Deviation				Disposition			
Forward Swaged portion of D5611-1 was not trimmed by supplier and was trimmed on this work order.				Acceptable to trim D5611-1 per D5611 Rev.A Swage length = $3.593^{+0.060}_{-0.000} = \underline{3.712} \text{ (-0.118)}$ Overall length = $106.83 \pm 0.06 = \underline{12.6675} \checkmark$ overall height = 12.64 ± 0.13 <u>CP</u> Acceptable for test <u>CP 18/10/3</u>			
Root Cause				FAULT CATEGORY			
Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Presservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐				Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread ☐			
Other/Details:							



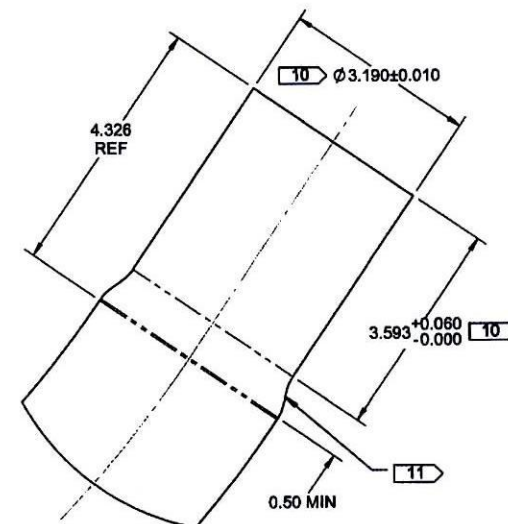
D5611-1 SKIDTUBE (EC130)



SECTION A-A
SCALE 2X



AUXILIARY VIEW
SCALE 0.5X



DETAIL B
SCALE 4X

NOTES:

- 1) MATERIAL: MAKE FROM D8031-120
STRAIGHT LENGTH = 120.00" (BEFORE BENDING / TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT EXTRUSION PER DART QSI 005 4.1 PRIOR TO SENDING EXTRUSION TO OUTSIDE VENDOR
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.40 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, WRINKLES, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 9) MAXIMUM TUBE FLATTENING DUE TO BENDING IS 2% BASED ON OD.
- 10) SWAGE 3.593^{+0.060}_{-0.000} LENGTH AT THE BENT END OF THE TUBE TO Ø 3.190±0.010
- 11) SWAGED TRANSITION MUST BE SMOOTH, GRADUAL, AND WITHOUT VISIBLE DISCONTINUITIES

RELEASED

2018 OCT 02
ECN 14-017

APPROVED

A	NEW ISSUE		ZF	18.05.07
REV.		DESCRIPTION	BY	DATE
DESIGN	NO	DART AEROSPACE LTD		
DRAWN	ZF	HAWKESBURY, ONTARIO, CANADA		
CHECKED	MW	DRAWING NO.		REV. A
MFG. APPR.	JFS	D5611		SHEET 1 OF 1
APPROVED	NO	TITLE		SCALE
DE APPR.	CP	SKIDTUBE (EC130)		NTS
DATE	18.05.07	COPYRIGHT © 2018 BY DART AEROSPACE LTD		
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.				



DART
AEROSPACE

NCR No.

Route update only

Job: <u>182415</u>		DISPOSITION		DEPARTMENT/PROCESS							
Part No. <u>D130-1048-042</u>		Rework ☐ Scrap ☐ Use-as-is ☒		Skid-tube ☐ Machining ☐ Large Fab ☐		Cross tube ☐ Small Fab ☐ Finishing ☐		Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐		Engineering ☒ Water Jet ☐ Supplier Quality ☐	
Date: <u>10/10/3</u>		Sequence #:		QTY Affected:				MRB (QSI042)			
Description Work Order Deviation				Disposition				Completed By			
Pressure is not required on flying surfaces.				Acceptable. No effect on test.				DAS 12 14/10/3			
								DAS 12 14/10/3			
								Lead hand / Supervisor			
Root Cause				FAULT CATEGORY				QC / QA Coordinator			
Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐				Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐				Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread ☐			
				Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐				Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐			
				Other/Details:							